

CLAIMS

The invention claimed is:

1. A method for creating a dither pattern structure, said method comprising:
 - a. establishing a first multi-dimensional array of dither pattern tiles, said array comprising a first upper horizontal spatial frequency bound, a first lower horizontal frequency bound, a first upper vertical spatial frequency bound, a first lower vertical spatial frequency bound, a first upper temporal frequency bound and a first lower temporal frequency bound;
 - b. wherein said spatial frequency bounds and said temporal frequency bounds define a high-pass pattern configuration;
 - c. establishing a second multi-dimensional array of dither pattern tiles, said array comprising a second upper horizontal spatial frequency bound, a second lower horizontal frequency bound, a second upper vertical spatial frequency bound, a second lower vertical spatial frequency bound, a second upper temporal frequency bound and a second lower temporal frequency bound;
 - d. wherein said second lower temporal frequency bound is lower than said first lower temporal frequency bound; and
 - e. associating said first multi-dimensional array of dither pattern tiles with a first range of image characteristic values; and
 - f. associating said second multi-dimensional array of dither pattern tiles with a second range of image characteristic values.
2. A method as described in claim 1 wherein said image characteristic values comprise luminance values.
3. A method as described in claim 1 wherein said image characteristic values comprise localized average luminance values.

4. A method for adaptive processing of a digital image, said method comprising:
- a. receiving a digital image;
 - b. designating a location in said image for application of a dither pattern tile;
 - c. determining a local image characteristic for that tile location;
 - d. selecting a first dither pattern tile set from a plurality of dither pattern tile sets wherein said selecting is based on said local image characteristic.
5. A method for adaptive processing of a digital image, said method comprising:
- a. dividing a digital image into tile block locations;
 - b. determining a local luminance characteristic for each of said tile block locations;
 - c. selecting a dither pattern array from among a plurality of dither pattern arrays wherein each of said arrays is associated with a range of values of said local luminance characteristic.
6. A method for adaptive processing of a digital image, said method comprising:
- a. establishing a first multi-dimensional array of dither pattern tiles, said array comprising a first upper horizontal spatial frequency bound, a first lower horizontal frequency bound, a first upper vertical spatial frequency bound, a first lower vertical spatial frequency bound, a first upper temporal frequency bound and a first lower temporal frequency bound;
 - b. establishing a second multi-dimensional array of dither pattern tiles, said array comprising a second upper horizontal spatial frequency bound, a second lower horizontal frequency bound, a second upper vertical spatial frequency bound, a second lower vertical spatial frequency bound, a second upper temporal frequency bound and a second lower temporal frequency bound, wherein said second lower temporal frequency bound is lower than said first lower temporal frequency bound; and
 - c. associating said first multi-dimensional array of dither pattern tiles

- with a first range of local luminance characteristic values; and
- d. associating said second multi-dimensional array of dither pattern tiles with a second range of local luminance characteristic values.
 - e. dividing a digital image into tile block locations;
 - 5 f. determining a local luminance characteristic for a multiplicity of said tile block locations;
 - g. selecting a dither pattern tile from said first multi-dimensional array of dither pattern tiles for application on a first set of tile block locations when said first tile block locations have local luminance characteristic values that fall within said first range; and
 - 10 h. selecting a dither pattern tile from said second multi-dimensional array of dither pattern tiles for application on a second set of tile block locations when said second tile block locations have local luminance characteristic values that fall within said second range.
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7. A system for adaptive processing of a digital image, said system comprising:
- a. a first multi-dimensional array of dither pattern tiles, said array comprising a first upper horizontal spatial frequency bound, a first lower horizontal frequency bound, a first upper vertical spatial frequency bound, a first lower vertical spatial frequency bound, a first upper temporal frequency bound and a first lower temporal frequency bound, wherein said first multi-dimensional array is associated with a first range of local luminance characteristic values;
 - 20 b. a second multi-dimensional array of dither pattern tiles, said array comprising a second upper horizontal spatial frequency bound, a second lower horizontal frequency bound, a second upper vertical spatial frequency bound, a second lower vertical spatial frequency bound, a second upper temporal frequency bound and a second lower temporal frequency bound, wherein said second lower temporal frequency bound is lower than said first lower temporal frequency bound, wherein said second multi-dimensional array is associated with a second range of local luminance characteristic values; and
 - 30 c. a selector for selecting between said first array and said second array based on the local luminance characteristic value for a location
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in said image.

8. An image display device comprising:

- a. image storage for storing an image to be displayed;
- 5 b. a dither array storage having contents comprising
 - i. a first multi-dimensional array of dither pattern tiles, said array comprising a first upper horizontal spatial frequency bound, a first lower horizontal frequency bound, a first upper vertical spatial frequency bound, a first lower vertical spatial frequency bound, a first upper temporal frequency bound and a first lower temporal frequency bound, wherein said first multi-dimensional array is associated with a first range of local luminance characteristic values; and
 - 10 ii. a second multi-dimensional array of dither pattern tiles, said array comprising a second upper horizontal spatial frequency bound, a second lower horizontal frequency bound, a second upper vertical spatial frequency bound, a second lower vertical spatial frequency bound, a second upper temporal frequency bound and a second lower temporal frequency bound, wherein said second lower temporal frequency bound is lower than said first lower temporal frequency bound, wherein said second multi-dimensional array is associated with a second range of local luminance characteristic values;
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- 20 c. a processor for determining a local luminance characteristic value for an image location; and
- 25 d. a selector for selecting between said first array and said second array based on the local luminance characteristic value for said image location.